Cognitive factor Affecting Elderly in Community

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Abstract

The purpose of this research is to identify major factors that influence the cognition the elderly in community. There was a significant correlation between the cognitive and visual perceptual skills of the elderly. The subject's cognitive skill was statistically higher for males by gender, for lower age group, and for higher level of education.

1. Introduction

1.1. Research Background

The society is rapidly aging, and therefore, the number of diseases followed by this such as dementia and cerebral infarction is also increasing. Among older people aged 65 or older, 12.1% of the elderly population is suffering from geriatric diseases [1] .During the aging process of the elderly, physiological, psychological, and cognitive changes occur, and among them, cognitive decline due to cognitive changes is the most basic pathological aspect of senile mental disorder including dementia. Therefore, research of the cognitive function of the elderly and other related studies are very important. Recognition generally refers to a wide range of intellectual abilities involved in the acquisition, processing, storage and retrieval of information about themselves and the surrounding environment [2] . The areas of cognitive function include orientation, insight, awareness, concentration, visual perception ability,

exercise plan, memory, executive ability, organization ability, and problem-solving ability. Cognitive impairment is manifested by memory loss, disorientation, diminished judgment, and comprehension, thereby resulting in loss of function, increased dependence, and decreased self-esteem.

Visual perception is a process by which the central nervous system integrates visual information to determine size, shape, and object space relationships by integrating visual information into the cognitive concept to convert basic data from the retina to adapt from the environment [3] . The domain of visual perception includes visual concentration, visual memory, visual discernment, visual perception, spatial perception, visual image, and integration of visual stimuli that coordinate different senses. Visual impairments are disorders of the cerebral cortex, which make it difficult to recognize or understand information from the visual system [4] . Recognition is a series of complex thinking process that learn from past experience and create new ideas [5] which should be the basis for the integration of senses and visual perception. [6] . Looking at the impact of visual impairments on cognitive functions, visual impairments include difficulty in writing due to visual impairments, poor visual concentration due to eye disturbances, difficulty in having geographical orientation, and the inability to identify sophisticated ones, which take a long time to perform various tasks [7] . Therefore, it is important to evaluate cognitive and visual perceptual ability of the elderly to manage the remaining life and to keep them healthy. In this study, the correlation between cognitive ability and visual perception ability

of the elderly will be influenced by existing perceptual study on the basis that cognitive ability will be subject to visual perception. The purpose of this research is to identify major factors that influence the cognition the elderly in community.

2. Research Method

2.1 Subject

The study was conducted on 102 elderly people aged 65 years and older living in one urban area. The study subjects were relatively healthy elderly people who were not diagnosed with dementia, who have not had any experience of brain damage, and were able to live independently in their daily life. The data collection period was one week from June1 to June 30, 2018.

2.2. . Research Tolls and Methods

1) MMSE-K (*Min-Mental State Examination* -Korean version)
 The dementia screening test was *Min-Mental State Examination* introduced by Folstein et al. in 1975, which has been translated into Korean by Kwon, Young cheol [8]   and several Korean researchers, and is now widely used. In this study, MMSE-K was used. The MMSE-K has been developed to be the Korean standardized assessment tool by Lee, Don young et al. [9]   considering age, education, and gender.
 2) MVPT(Motor Free Visual Perception)
   The MVPT test used in the study assessed visual perceptual skills without using motor function. MVPT is the range of standardization data was broader, and the items of higher degree were added to increase the validity of the adult evaluation[10] . The following are the detailed categories of each MVPT test: Visual discrimination, Form constancy, Visual Short Term Memory , Visual Closure , Spatial Orientation, Figure Ground,
 3) Research Course
   The evaluation used in the experiment was MPT to evaluate visual perceptual ability and MMSE-K to evaluate cognitive ability. Before the evaluation, the subject of the evaluation was explained the purpose and contents of the assessment, and they gave their consent. First, a general survey was conducted to obtain basic information of the subject. Each assessment was conducted in a quiet space that could maximize the concentration of the elderly. The tests were conducted in the order of the survey, MMSE, and MVPT by students and professional occupational therapists who learned and understood the tools of each test with training by the experts.

2. 3 Data Analysis

   Data processing of this study was done using SPSS 18.0 statistical program. The t-test was used to analyze differences in gender, age, educational level, cognitive ability, and visual perceptual ability. Pearson correlation analysis was used to examine the relationship between cognitive ability and visual perceptual ability. In order to test statistical significance, significance level was set at p-value of 0.05 or less.

3. Results

3.1 Cognitive ability test scores according to gender, age, and education level

Mean cognitive abilities by gender were 24.03±4.11 for women, and 24.74±4.02 for men which was slightly higher than that of women. The cognitive scores according to age were divided into two groups: that under 70 and over 70 of age, and this is because the average age of the subjects was 70 years old. The mean score for age of the elderly under 70 years of age was 24.32±3.50 and for those who are 70 years old or more was 22.93±4.27 which the younger group's score was higher than the older group. The cognitive ability score according to the level of education was divided into two groups: 1. those who received primary school education or more, and 2. those with elementary school diploma or no formal education. This is because the average of the education experience of the surveyed people was in the baseline to be classified from those two groups. The mean value of those who received primary school education or more was 24.24±4.07, and the

mean value of those who received elementary school education or less was 22.48 ±3.86, which the higher education level group showed a slightly higher score. The mean scores of cognitive abilities of the elderly using the MMSE-K were higher than those of men, younger group, and higher education level, but no statistically significant (Table 1).

Table 1. Brain damage and paralysis type

Sub-items	Category	Score	Value
Gender	Male	24.74±4.02	.612
	Female	24.03±4.11	
Age	65~69	24.39±3.50	1.27
	70 or older	22.93±4.27	
Education Level	Elementary - College	24.24±4.07	-1.81
	Uneducated - Elementary	22.48±3.86	

*p< 0.05

3.2. Scores by sub-items of cognitive ability test according to the gender, age and education level

In the cognitive ability test scores by sub-items according to gender, men showed higher values in most of the sub- items of cognitive ability, and slightly different. This was in the order of attention (8.23±1.51) and orientation (8.23±1.51). The age was divided into those younger than 70, and those 70 or older. This is because the average age of the subjects was 70 years old. The sub-items scores were also higher in the younger age group of those who are younger than 70, in the order of orientation (8.48±1.38), and attention (4.20±913).Differences in educational level showed higher values in the higher education level, and the degree of education affects the cognitive abilities of the elderly more than gender and age. The scores of the cognitive ability sub-items of the elderly using MMSE-K were higher for men, 69 years of age or younger, and those with higher education. However, this was not statistically significant (Table 2).

Table 2. MMSE-K scores for the sub-items according to gender, age, and education level

Sub-items	Male	Female	t-value	60~69	70or older	t-value	Elementary - College	Uneducated - Elementary	t-value
Orientation	9.23±1.51	8.96±1.37	.743	8.48±1.38	7.91±1.46	1.58	8.41±1.48	7.77±1.35	-1.81
Memory	4.60±1.04	4.55±1.12	.047	4.80±.913	4.42±1.13	1.51	4.78±1.00	4.29±1.10	-1.93
Language Skills	5.01±.938	4.55±.827	.174	4.76±.723	4.47±.96	1.43	4.68±94	4.45±.81	-1.03
Understanding	1.41±.498	4.55±1.12	.254	1.40±.500	1.40±.49	.037	1.43±.50	1.35±.48	-.644
Attention	4.15±.961	3.97±.944	.805	4.20±.913	4.00±.97	.834	4.16±.95	3.97±.94	-.837
Visual Skills	.79±.409	.72±.455	.672	.80±.408	.74±.44	.516	.78±.41	.74±.44	-.400

*p< 0.05

3.3. Visual perceptual ability score according to gender, age, and education level

The scores of visual perceptual ability scores were 28.74±7.79 for males and 26.18±6.99 for females, which men's scores were higher than females but not statistically significant. According to age, MVPT scores were divided between those younger than 70years of age and those 70 years old or older. The mean score of the group who are younger than 70 were 29.54 ± 7.93 and of the group who are 70 or older was 26.32 ± 7.01, which the younger group had a higher score. However, it was not statistically significant. . The mean value of

those who received primary school education or more was 30.84±7.012, and the mean value of those who received elementary school education or less was 23.91± 6.312, which the higher education level group showed significantly higher score. (p< 0.05).

Table 3. MVPT score according to gender, age, and education level

	characteristics	score	t-value
gender	male	28.74±7.79	1.46
	female	26.18±6.99	
age	65~69	29.54±7.93	1.75
	70 or older	26.32±7.01	
Education level	Elementary - College	30.84±7.01	-4.41
	Uneducated - Elementary	23.91±6.31	

*p< 0.05

3.4. Correlation between Cognitive Function and Visual perceptual ability score

The correlation between cognitive function and Visual perceptual ability score of elderly people are as follows when analyzed (Table 4). There was significant correlation between the total scores of MMSE-K and the total scores of MVPT. Out of the total scores of MVPT and the 6 sub-categories of MMSE-K, with the exception of Visual Skill and Understanding showed significant correlation.

Table 4 . Correlation between Cognitive Function and Visual perceptual ability score

	MMSE-K						
	MMSE-K	Orientation	Memory	language	Understanding	Attention	Visual Skill
MVPT	.405*	-.391*	.503*	-.226*	.155	.745*	.132

* p <0.05

4. Discussion

The Elderly live the rest of their lives with many difficulties due to manifold the attainment of a super-aged society. However, in most cases, elderly people have a lowered quality of life due to cognitive impairment and physical problems. In this study, through research of elderly people's cognitive function and quality of life, it was sought to provide basic data for cognitive enhancement in order to improve the quality of life of The elderly . The research was conducted on 102 elderly who are aged over 65, who have not experienced any brain damage, and can independently do things on their own in their daily lives. The MMSE-K was used to evaluate the cognitive skills and the MVPT was used to evaluate the visual perceptual skills. When looking at previous research on cognitive function of elderly patients who used LOTCA conitive function test , Cha yoo Jin [11] reported that when comparing stroke patients' clinical group with a normal elderly group, the group with a lower age had higher scores, and Jang gi yun et al. [12] had results that said that men have high cognitive function than women with higher education and lower age, and this is in agreement with this study. However, there were some limitations in this study. First, the subject was localized in one area, and second, the number of subjects was limited. Therefore, in future research, we will conduct a prospective study by expanding the target area, increase the number of subjects and the research should be continued on the cognitive ability and visual perceptual skills of the elderly with disabilities. In future studies, the research should be done with wider age range, and more number of subjects, and ultimately should be divided into two groups: those with and

without disabilities.

5. Conclusion

This study was designed to find out relationships between cognitive function and visual perceptual ability of elderly in community. In this study, through research of elderly people's cognitive function and perceptual function, it was sought to provide basic data for cognitive enhancement in order to improve the quality of life of elderly people. Therefore, in future research, we will conduct a prospective study by expanding the target area, increase the number of subjects and the research should be continued on the cognitive ability and visual perceptual skills of the elderly with disabilities. In future studies, the research should be done with wider age range, and more number of subjects, and ultimately should be divided into two groups: those with and without disabilities.

Acknowledgement

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